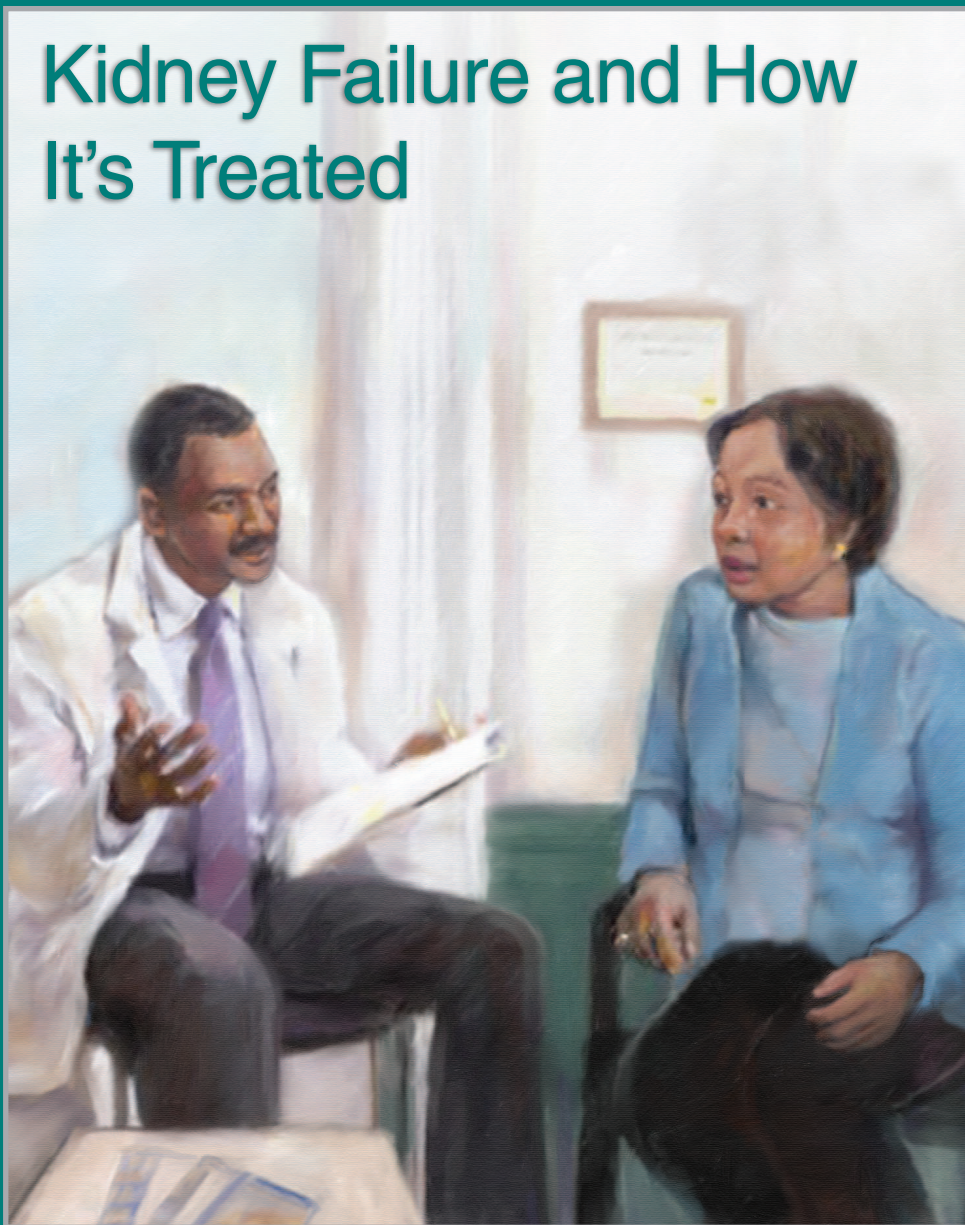


# What I need to know about

## Kidney Failure and How It's Treated



National Institute of  
Diabetes and Digestive  
and Kidney Diseases

**ADULT** UROLOGY &  
**PEDIATRIC** UROGYNECOLOGY



What I need to know about  
Kidney Failure and How  
It's Treated

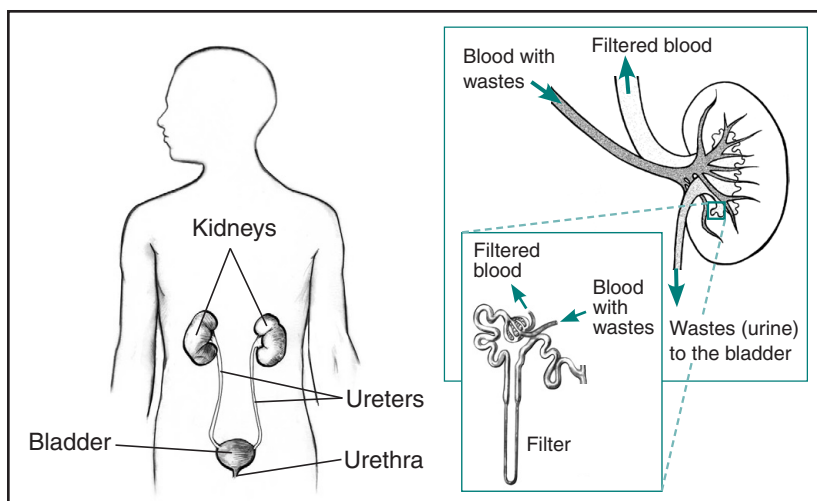
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## What are my kidneys and what do they do?

You have two kidneys. The kidneys are shaped like beans. Each kidney is about the size of a fist. They are located just below your ribcage, one on each side of your spine. Your kidneys filter your blood. Each kidney is made of 1 million little filters. During every minute of every day, these filters take out waste materials that can hurt you. They also take out extra fluid from your blood. The wastes and extra fluid make urine. The urine flows from your kidneys to your bladder through tubes called **ureters**\*. The bladder stores urine until you urinate. Then, urine leaves the body through a tube called the **urethra**.

\*See the Pronunciation Guide for tips on how to say the words in **bold** type.



Each kidney is made of 1 million little filters.

## What is kidney failure?

Kidney failure means your kidneys no longer filter your blood well enough to keep you healthy. Failing kidneys do a poor job of removing wastes and extra fluid from your blood. Wastes and extra fluid begin to build up. The buildup of wastes can make you sick. You may have the following symptoms:

- ankle, face, or belly swelling
- stomach sickness
- throwing up
- loss of appetite

- loss of sense of taste
- feeling tired
- weakness
- confusion
- headaches

## What are the most common causes of kidney failure?

Diabetes and high blood pressure are the most common causes of kidney failure. Other factors include heart and blood vessel disease and a family history of kidney failure. African Americans, Hispanics/Latinos, and American Indians are more likely to have kidney failure.



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The buildup of wastes can make you sick.

## What are the treatments for kidney failure?

The treatments for kidney failure are

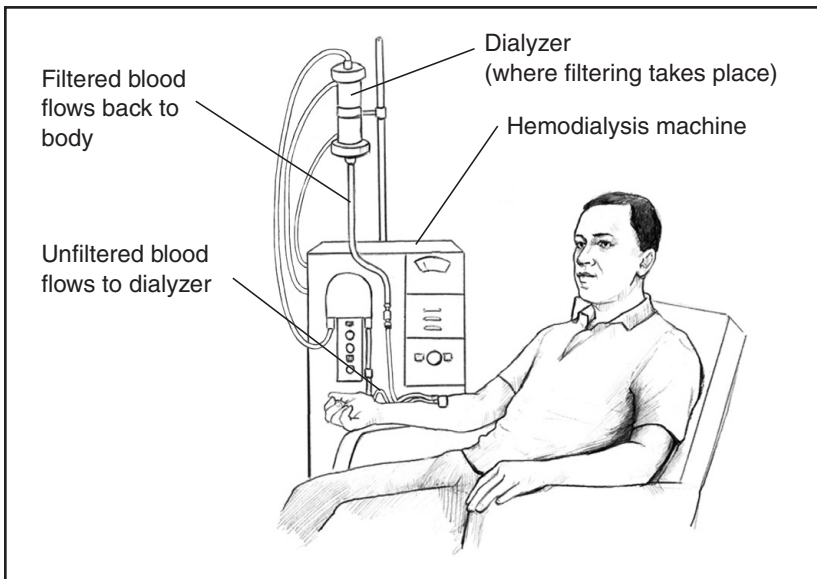
- **hemodialysis**
- **peritoneal dialysis**
- a kidney **transplant**
- conservative management

## What is hemodialysis?

Hemodialysis is a treatment for kidney failure that is done in a center several times per week. Some people learn to do hemodialysis in their homes. Hemodialysis uses a machine to filter your blood when your kidneys are too sick to filter any more. With hemodialysis, your blood is filtered outside of your body. Unfiltered blood is removed from the body and flows to the dialyzer to be cleaned. Filtered blood flows back to the body. First, a dialysis nurse places two needles into your arm. A pump on the hemodialysis machine draws your blood through one of the needles into a tube. The tube takes the blood to a filter, called a **dialyzer**. Inside the dialyzer, your blood



flows through thin fibers that are like straws. The wastes and extra fluid leave the blood through tiny holes in the fibers. Then, a different tube carries the filtered blood back to your body through the second needle. The hemodialysis machine throws out the wastes and extra fluid, just like how your body makes urine. Hemodialysis does not make the kidneys better. However, it may help you feel better by filtering your blood when your kidneys fail.



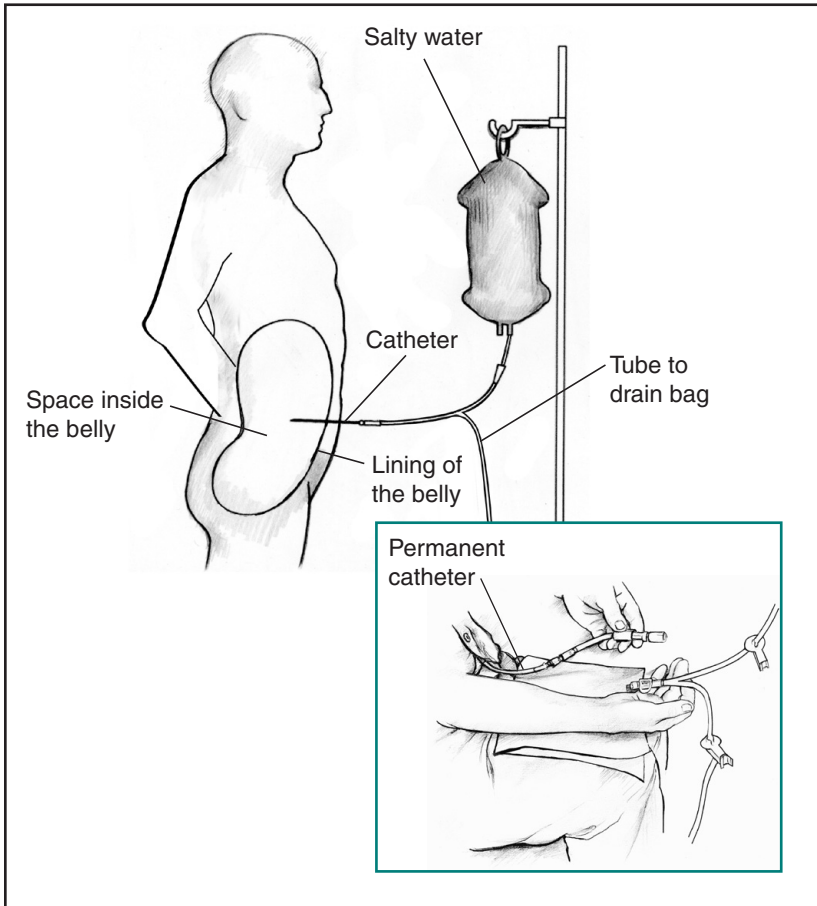
In hemodialysis, unfiltered blood is removed from the body and flows to the dialyzer to be cleaned. Filtered blood flows back to the body.

## What is peritoneal dialysis?

Peritoneal dialysis uses the lining of your belly to filter your blood inside your body. You can do peritoneal dialysis at home because it uses your body to filter. A doctor will place a soft tube called a **catheter** in your belly a few weeks before you start treatment. The catheter stays in your belly permanently.

The catheter lets you put a kind of salty water from a plastic bag into your belly. Then, you can move around and go about your day. While the salty water is inside your belly, it soaks up wastes and extra fluid from your body. After a few hours, you drain the salty water from your belly into a drain bag. The salty water removes wastes and extra fluid from your body. The salty water can be thrown away into a toilet or tub. Then you start over with a fresh bag of salty water. You will empty and fill your belly four to six times a day.

The salty water is always in your belly soaking up wastes and extra fluid. Peritoneal dialysis does not make the kidneys better. However, it may help you feel better by filtering your blood when your kidneys fail.



In peritoneal dialysis, the catheter stays in your belly permanently.

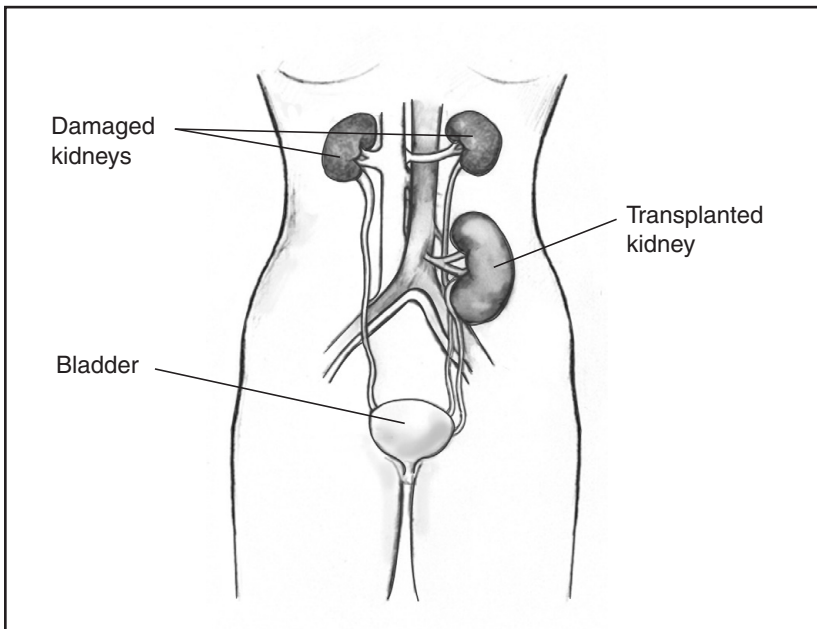
## **Is dialysis a cure for kidney failure?**

No. Hemodialysis and peritoneal dialysis help you feel better and live longer; however, they do not cure kidney failure. Although people with kidney failure are now living longer than ever, over the years kidney disease can cause problems such as heart disease, bone disease, arthritis, nerve damage, infertility, and malnutrition. These problems won't go away with dialysis; however, doctors now have new and better ways to prevent or treat them. You should discuss these problems and their treatments with your doctor.

## **What is a kidney transplant?**

A kidney transplant places a healthy kidney from another person into your body. The kidney may come from someone who has just died. Your doctor will place your name on a waiting list for a kidney. A family member or friend might be able to give you a kidney. Then you don't have to wait.

Once it is placed inside your body, the new kidney takes over filtering your blood. The damaged kidneys usually stay where they are. The new kidney is placed in the front-lower abdomen, on one side of the bladder. Your body normally attacks anything that shouldn't be there, such as bacteria. The body will think the new kidney shouldn't be there. You will take medicines called **immunosuppressants** to keep your body from attacking the new kidney.



Kidney transplant

Read more in the following publications from the Kidney Failure Series at [www.kidney.niddk.nih.gov](http://www.kidney.niddk.nih.gov):

- *Treatment Methods for Kidney Failure: Hemodialysis*
- *Home Hemodialysis*
- *Treatment Methods for Kidney Failure: Peritoneal Dialysis*
- *Treatment Methods for Kidney Failure: Transplantation*

## What is conservative management?

Conservative management means your doctors take care of you without dialysis or a transplant. The doctors may give you medicines that make you feel more comfortable. You can have conservative management in your home. You may want to go to a hospice, a special place where you receive nursing care. Some people choose conservative management when dialysis or a transplant would not help them live longer or would make them suffer longer. Without dialysis or a transplant, you may live for a few weeks or several months.

## How do I decide which treatment is right for me?

If you have kidney failure, learn about the treatments and think about which one best fits you. Talk with people who are on hemodialysis or peritoneal dialysis. Ask what is good and bad about each treatment. If you make a choice and find you don't like it, talk with your doctor about trying something else. Ask your doctor about the transplant waiting list and the medicines needed after a transplant. Talk with people who have had kidney transplants and ask how it has changed their lives.

If you plan to keep working, think about which treatment choice would make working easier. If spending time with family and friends means a lot to you, ask which treatment gives you the most free time. Find out which treatment will give you the best chance to be healthy and live longer.

If you are thinking about conservative management, you may wish to speak with your family, friends, doctor, or mental health counselor as you decide.

You can take control of your care by talking with your doctor. You may need time to get used to your new treatment. Kidney failure can make your life harder. Treatments can help improve your life.

## What questions should I ask my doctor?

You may want to ask your doctor these questions:

- Which treatment for kidney failure is the best treatment choice for me? Why?
- If I'm treated at a dialysis center, can I go to the center of my choice?
- What should I look for in a dialysis center?
- Will my kidney doctor see me at dialysis?
- As a hemodialysis patient, will I be able to keep working? Can I have treatments at night? Will I be able to care for my children?
- How much should I exercise?
- Whom do I contact with problems?
- Who will be on my health care team? How can the members of my health care team help me?
- With whom can I talk about finances, sex, or family concerns?
- How/where can I talk with other people who have faced this decision?
- How long can someone like me expect to live on dialysis?

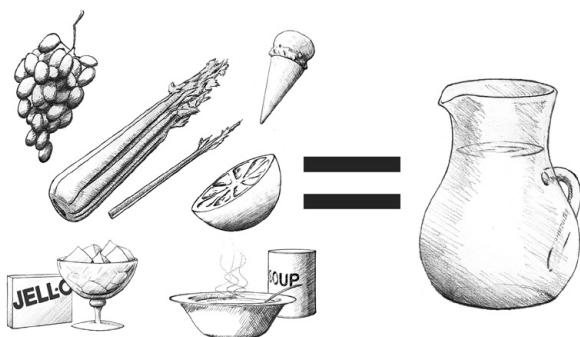


## Eating, Diet, and Nutrition

Eating healthy foods can help you keep up your energy and strength. All dialysis and transplant centers have a **dietitian**. The dietitian helps people with kidney failure learn about healthy food choices. You should talk with your center's dietitian to make a meal plan.

The best diet for you will depend on which kidney failure treatment you choose after talking with your doctor.

- Hemodialysis
  - Limit how much liquid and water you drink. Fluid can build up in your body between hemodialysis sessions. Also, many foods contain water. The extra fluid in your body can cause swelling and high blood pressure. Extra fluid in your body makes your heart work harder.



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Many foods contain water.

- Limit **sodium**, or salt. Watch out for sodium in frozen foods and prepared meals. You can also find sodium in canned foods, hot dogs, and fast food. Sodium makes you thirsty, which makes you drink more water and other liquids than you should.

Read more in the National Kidney Disease Education Program (NKDEP) fact sheet *Sodium* at [www.nkdep.nih.gov](http://www.nkdep.nih.gov).

- Limit **potassium**. Potassium is found in many fruits and vegetables such as potatoes, tomatoes, oranges, and bananas. Too much potassium can make your heart beat unevenly. Hemodialysis does not remove potassium from your body well.

Read more in the NKDEP fact sheet *Potassium* at [www.nkdep.nih.gov](http://www.nkdep.nih.gov).

- Eat **protein**-rich foods such as meat, fish, and eggs. Hemodialysis removes protein from your body.

Read more in the NKDEP fact sheet *Protein* at [www.nkdep.nih.gov](http://www.nkdep.nih.gov).

- Limit **phosphorus**. Phosphorus helps your bones, blood vessels, and muscles work.

However, too much phosphorus can make your bones weak. Limiting phosphorus can be hard. Foods that contain phosphorus, such as meat and milk, also contain protein that you need. You should be careful to eat enough protein, yet not so much that you get too much phosphorus. You can avoid other foods that contain phosphorus, such as cola, tea, beans, and nuts.

Read more in the NKDEP fact sheet *Phosphorus* at [www.nkdep.nih.gov](http://www.nkdep.nih.gov).

- Find healthy ways to add calories to your diet. Calories are found in all foods and give your body energy. Many people on hemodialysis do not have a good appetite and do not get enough calories. Vegetable oils are good sources of calories. Vegetable oils include olive oil, canola oil, and safflower oil. Use them on breads, rice, and noodles. Hard candy, sugar, honey, jam, and jelly provide calories and energy. However, if you have diabetes, speak with your doctor or dietitian before eating extra sweets.

Read more about nutrition for people who are on hemodialysis in *Eat Right to Feel Right on Hemodialysis* at [www.kidney.niddk.nih.gov](http://www.kidney.niddk.nih.gov).

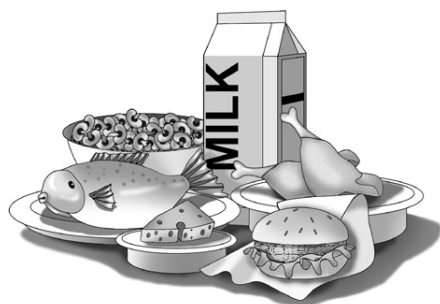
- Peritoneal dialysis
  - Drink as much water and other liquids as you need. If you are holding too much fluid or too little fluid, your doctor needs to know.
  - Limit sodium to control your thirst and help prevent heart problems. You can use spices other than salt to flavor your food.



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You can use spices other than salt to flavor your food.

- You may need to eat more potassium-rich foods. Peritoneal dialysis removes potassium from your body. Talk with your doctor or dietitian about the right amount of potassium for you.
- Eat protein-rich foods. Peritoneal dialysis removes even more protein from your body than hemodialysis.
- Limit phosphorus to keep your bones strong.
- You may need to limit your calorie intake. The salty water also contains some sugar. Your body absorbs the sugar, which can cause you to gain weight.
- Kidney transplant
  - Limit sodium to help prevent heart problems.
  - You should be able to eat normal amounts of phosphorus and potassium. You may need to adjust the amounts if blood tests show a problem.




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Eat protein-rich foods.

- Eat protein-rich foods to repair muscle breakdown and protect against infection.
- You may need to limit your calories. The medicines you take can make you gain weight.
- Conservative management
  - Limit protein to prevent the buildup of wastes in your blood.

You may have other needs and limits, depending on how well your treatments work.

## Points to Remember

- Kidney failure means your kidneys no longer filter your blood well enough to keep you healthy.
- The treatments for kidney failure are
  - hemodialysis
  - peritoneal dialysis
  - a kidney transplant
  - conservative management

- Hemodialysis uses a machine to filter your blood when your kidneys are too sick to filter any more.
- Peritoneal dialysis uses the lining of your belly to filter your blood inside your body.
- A kidney transplant places a healthy kidney from another person into your body.
- Conservative management means your doctors take care of you without dialysis or a transplant. The doctors may give you medicines that make you feel more comfortable.
- All dialysis and transplant centers have a dietitian. The dietitian helps people with kidney failure learn about healthy food choices.

## Hope through Research

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), through its Division of Kidney, Urologic, and Hematologic Diseases, supports several programs and studies devoted to improving treatment for people with permanent kidney failure. For example, the Hypertension in Hemodialysis Patients study, funded under National Institutes of Health (NIH) clinical trial number NCT00582114, is testing the theory that treating hemodialysis patients with the blood pressure medicine lisinopril will be more effective in preventing heart enlargement when compared with treatment that uses another blood pressure medicine called atenolol, even when the two medicines achieve the same blood pressure goals.

Clinical trials are research studies involving people. Clinical trials look at safe and effective new ways to prevent, detect, or treat disease. Researchers also use clinical trials to look at other aspects of care, such as improving the quality of life for people with chronic illnesses. To learn more about clinical trials, why they matter, and how to participate, visit the NIH Clinical Research Trials and You website at [www.nih.gov/health/clinicaltrials](http://www.nih.gov/health/clinicaltrials). For information about current studies, visit [www.ClinicalTrials.gov](http://www.ClinicalTrials.gov).



## Pronunciation Guide

**catheter** (KATH-uh-tur)

**dialyzer** (DY-uh-LY-zur)

**dietitian** (dy-uh-TISH-uhn)

**hemodialysis** (HEE-moh-dy-AL-ih-siss)

**immunosuppressants** (IM-yoo-noh-soo-PRESS-uhntss)

**peritoneal dialysis** (PAIR-ih-toh-NEE-uhl)  
(dy-AL-ih-siss)

**phosphorus** (FOSS-foh-ruhss)

**potassium** (poh-TASS-ee-uhm)

**protein** (PROH-teen)

**sodium** (SOH-dee-uhm)

**transplant** (TRANZ-plant)

**ureters** (YOO-ruh-turz)

**urethra** (yoo-REE-thruh)

## For More Information

### **American Association of Kidney Patients**

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Tampa, FL 33607

Phone: 1-800-749-2257 or 813-636-8100

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Email: [info@aakp.org](mailto:info@aakp.org)

Internet: [www.aakp.org](http://www.aakp.org)

### **American Kidney Fund**

11921 Rockville Pike, Suite 300

Rockville, MD 20852

Phone: 1-800-638-8299

Internet: [www.kidneyfund.org](http://www.kidneyfund.org)

### **American Society of Transplantation**

15000 Commerce Parkway, Suite C

Mount Laurel, NJ 08054

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**Life Options**

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414 D'Onofrio Drive, Suite 200

Madison, WI 53719

Phone: 1-800-468-7777 or 608-833-8033

Fax: 608-833-8366

Internet: [www.kidneyschool.org](http://www.kidneyschool.org)

[www.lifeoptions.org](http://www.lifeoptions.org)

**National Kidney Foundation**

30 East 33rd Street

New York, NY 10016-5337

Phone: 1-800-622-9010 or 212-889-2210

Fax: 212-689-9261

Internet: [www.kidney.org](http://www.kidney.org)

**United Network for Organ Sharing**

P.O. Box 2484

Richmond, VA 23218

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Fax: 804-782-4817

Internet: [www.unos.org](http://www.unos.org)

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### **About the Kidney Failure Series**

The NIDDK Kidney Failure Series includes booklets and fact sheets that can help the reader learn more about treatment methods for kidney failure, complications of dialysis, financial help for the treatment of kidney failure, and eating right on hemodialysis. Free single printed copies of this series can be obtained by contacting the National Kidney and Urologic Diseases Information Clearinghouse.

## National Kidney Disease Education Program

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Internet: [www.nkdep.nih.gov](http://www.nkdep.nih.gov)

The National Kidney Disease Education Program (NKDEP) is an initiative of the National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, U.S. Department of Health and Human Services. The NKDEP aims to raise awareness of the seriousness of kidney disease, the importance of testing those at high risk, and the availability of treatment to prevent or slow kidney disease.

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This publication is also available at [www.kidney.niddk.nih.gov](http://www.kidney.niddk.nih.gov).

This publication may contain information about medications and, when taken as prescribed, the conditions they treat. When prepared, this publication included the most current information available. For updates or for questions about any medications, contact the U.S. Food and Drug Administration toll-free at 1-888-INFO-FDA (1-888-463-6332) or visit [www.fda.gov](http://www.fda.gov). Consult your health care provider for more information.

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